CLAIMS

1. A biocompatible polymer comprising 8-45 mol% of a unit originating from a polymerizable monomer having a polyalkylene oxide chain, 30-90 mol% of a unit originating from a polymerizable monomer having a hydrophobic group, and 2-50 mol% of a unit originating from a polymerizable monomer having a hydroxyl group.

2. The polymer according to claim 1, having a weight average molecular weight of 100,000 to 3,000,000.

3. The polymer according to claim 1 or claim 2, wherein the content ratio of the unit originating from the polymerizable monomer having a hydroxyl group to the unit originating from the polymerizable monomer having a hydrophobic group is from 0.05 to 1.

4. The polymer according to any one of claims 1 to 3, wherein the polymer is a nonionic polymer.

5. The polymer according to any one of claims 1 to 4, wherein the polymerizable monomer having a hydroxyl group has solubility in water at 20°C in the range from 3 wt% or more ,but less than 50 wt%.

6. The polymer according to claim 5, wherein the

polymerizable monomer having a hydroxyl group is 2-hydroxyisobutyl (meth)acrylate.

7. A selective leukocyte removal filter material comprising a polymer described in any one of claims 1-6 on at least the surface of a filter supporting body.

8. The selective leukocyte removal filter material according to claim 7, wherein the polymer has a solubility factor (δ value) of 10.0 to 11.5 and the filter supporting body has a solubility factor (δ value) of 7.0 to 15.0.

9. The filter material according to claim 7 or 8, wherein the amount of the polymer held on the filter supporting body is 0.001 wt% or more, but less than 10 wt%.

10. The filter material according to any one of claims 7 to 9, wherein the polymer coating rate of the filter supporting body is from 40% to 90%.

11. The filter material according to any one of claims 7 to 10, wherein the filter material is a woven fabric or nonwoven fabric.

12. The filter material according to claim 11, wherein the average fiber diameter of the woven or nonwoven fabric is from 0.5 μm to 50 μm and the filling density is from 0.05 g/cm^3

to 0.5 g/cm^3.

13. The selective leukocyte removal filter material according to any one of claims 7 to 12, used for selectively removal leukocytes from blood extracted from a patient of cellular immune abnormality.

14. The selective leukocyte removal filter material according to claim 13, wherein the disease is chronic or malignant rheumatoid arthritis, systemic erythematodes, Behcet's disease, idiopathic thrombo cytopenic purpura, autoimmune hepatitis, ulcerative colitis, Crohn's disease, atopic dermatitis, rapidly progressive glomerulonephritis, or systemic inflammatory response syndrome.

15. A selective leukocyte removal filter apparatus comprising the filter material according to any one of claims 7 to 12 packed in a container having at least a blood inlet port and a blood outlet port.

16. The selective leukocyte removal filter apparatus according to claim 15, wherein a hollow cylindrical filter formed from the filter material wound in the shape of a cylinder is packed in the container with both ends sealed, and either the blood inlet port or the blood outlet port is provided communicating with either the inner perimeter or the outer perimeter of the cylindrical filter material.

17. The selective leukocyte removal filter apparatus according to claim 16, wherein the hollow cylindrical filter has a configuration of a scroll of a laminated body made of a) the filter material in the form of a sheet and b) a spacer layer material in the form of a sheet allowing blood to pass through, the starting and/or terminal ends of the spacer layer rolled in the form of a scroll being open to the outer perimeter and/or the inner perimeter of the hollow cylindrical filter to provide a passage for blood.

18. The selective leukocyte removal filter apparatus according to claim 16 or claim 17, wherein the hollow cylindrical filter has a first blood contact layer with an area from 50 cm^2 to 1,000 cm^2.

19. The selective leukocyte removal filter apparatus according to claim 18, wherein the volume standard specific surface area of the first blood contact layer is 0.08 m^2/ml or more, but less than 1.0 m^2/ml.

20. The selective leukocyte removal filter apparatus according to claim 19, wherein the hollow cylindrical filter has a second blood contact layer with a volume standard specific surface area of 1.0 m^2/ml or more, but less than 20 m^2/ml.

21. The selective leukocyte removal filter apparatus

according to claim 20, wherein the thickness ratio of the second blood contact layer to the first blood contact layer is from 0.2 to 10.0.

22. The selective leukocyte removal filter apparatus according to any one of claims 16 to 21, wherein the thickness of the hollow cylindrical filter is from 0.6 mm to 12.0 mm.

23. The selective leukocyte removal filter apparatus according to any one of claims 15 to 22, wherein the filter material is maintained under the condition of the saturated moisture content or more using water or an aqueous solution of a water-soluble substance with a minimal risk of damage to living bodies and is sterilized.

24. The selective leukocyte removal filter apparatus according to claim 23, wherein the concentration of the water-soluble substance in the aqueous solution is 5 wt% or less.

25. The selective leukocyte removal filter apparatus according to claim 23 or 24, wherein the water-soluble substance is sodium chloride.

26. The selective leukocyte removal filter apparatus according to any one of claims 15 to 25, used for selectively removing leukocytes from blood extracted from a patient of

cellular immune abnormality.

27. The selective leukocyte removal filter apparatus according to claim 26, wherein the disease is or malignant rheumatoid arthritis, systemic erythematodes, Behcet's disease, idiopathic thrombo cytopenic purpura, autoimmune hepatitis, ulcerative colitis, Crohn's disease, atopic dermatitis, rapidly progressive glomerulonephritis, or systemic inflammatory response syndrome.

28. A selective leukocyte removal system comprising a blood delivery means, an anticoagulant fluid injection means, and a selective leukocyte removal means, wherein the selective leukocyte removal means comprises the selective leukocyte removal filter apparatus according to any one of claims 15 to 25.

29. The selective leukocyte removal system according to claim 28, wherein the blood delivery means delivers blood in a quantity from 1 l to 10 l at a flow rate of 10 ml/min to 200 ml/min.

30. The selective leukocyte removal system according to claim 28 or 29, wherein the anticoagulant fluid injection means injects an anticoagulant fluid at a rate of 1% to 20% of the blood flow rate.

31. The selective leukocyte removal system according to any one of claims 28 to 30, wherein the anticoagulant fluid injected from the anticoagulant fluid injection means comprises heparin or a low molecular weight heparin.

32. The selective leukocyte removal system according to any one of claims 28 to 30, wherein the anticoagulant fluid injected from the anticoagulant fluid injection means comprises a protease inhibitor.

33. The selective leukocyte removal system according to any one of claims 28 to 30, wherein the anticoagulant fluid injected from the anticoagulant fluid injection means comprises an ACD-A solution or an ACD-B solution.

34. The selective leukocyte removal system according to claim 31, wherein the amount of anticoagulant fluid injected is from 100 units to 2,000 units per 1 l of blood.

35. The selective leukocyte removal system according to claim 32, wherein the amount of anticoagulant fluid injected is from 2 mg to 40 mg per 1 l of blood.

36. The selective leukocyte removal system according to claim 33, wherein the amount of anticoagulant fluid injected is from 20 ml to 160 ml per 1 l of blood.

37. The selective leukocyte removal system according to any one of claims 28 to 36, used for selectively removing leukocytes from blood extracted from a patient of cellular immune abnormality.

38. The selective leukocyte removal system according to claim 37, wherein the disease is chronic or malignant rheumatoid arthritis, systemic erythematodes, Behcet's disease, idiopathic thrombo cytopenic purpura, autoimmune hepatitis, ulcerative colitis, Crohn's disease, atopic dermatitis, rapidly progressive glomerulonephritis, or systemic inflammatory response syndrome.

39. A method of treating cellular immune abnormality comprising causing the blood of the patient to come in contact with the selective leukocyte removal filter material according any one of claims 7 to 12.

40. The method according to claim 39, wherein the disease is chronic or malignant rheumatoid arthritis, systemic erythematodes, Behcet's disease, idiopathic thrombo cytopenic purpura, autoimmune hepatitis, ulcerative colitis, Crohn's disease, atopic dermatitis, rapidly progressive glomerulonephritis, or systemic inflammatory response syndrome.